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TEST REPORT
IEC 62031
LED modules for general lighting – Safety specifications

Report Number. ..... :	211100221SHA-001
Date of issue ..... :	Dec 2, 2021
Total number of pages ..... :	40
Name of Testing Laboratory preparing the Report ..... :	Intertek Testing Services Shanghai Building No. 86, 1198 Qinzhou Road (North), Shanghai 200233, CHINA
Applicant's name ..... :	KAISTAR Light (Xiamen) Co., Ltd
Address ..... :	Xiang Xing Rd, Xiang An Branch, Torch Hi-Tech Industrial Development Zone ,Xiamen, China
Test specification:	
Standard ..... :	IEC 62031:2018
Test procedure ..... :	Testing
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC62031F
Test Report Form(s) Originator .... :	Intertek Semko AB
Master TRF ..... :	2018-06-14

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

General disclaimer:

The test results presented in this report relate only to the object tested.
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Test item description ..... :	Built-in LED module
Trade Mark ..... :	bridgelux
Manufacturer ..... :	Same as applicant
Model/Type reference ..... :	See below
Ratings ..... :	See below

No	Type reference	Typical Voltage(V)	Typical Current(mA)	Typical Power Range	Tc
Use 1835 chips					
1	BXKC-xxx0801-A-1x	35.5	240	8.52	105
2	BXKC-xxx0801-B-1x	17.8	480	8.52	105
3	BXKC-xxx0801-D-1x	8.9	960	8.52	105
4	BXKC-xxx1501-B-1x	35.5	480	17.04	105
5	BXKC-xxx1501-D-1x	17.8	960	17.04	105
6	BXKC-xxx2000-C-1x	36	720	25.92	105
7	BXKC-xxx3000-D-1x	36	960	34.56	105
8	BXKC-xxx4000-E-1x	36	1200	43.2	105
9	BXKE-xxx0801-A-2x	35.6	240	8.54	105
10	BXKE-xxx0801-B-2x	17.8	480	8.54	105
11	BXKE-xxx0801-D-2x	8.9	960	8.54	105
12	BXKE-xxx1501-B-2x	35.4	480	16.99	105
13	BXKE-xxx1501-D-2x	17.7	960	16.99	105
14	BXKE-xxx0800-A-1x	37.4	960	35.9	105
15	BXKE-xxx1500-B-1x	37.4	960	35.9	105
16	BXKE-xxx2000-C-1x	37.4	720	26.93	105
17	BXKE-xxx30H0-D-1x	38	960	36.48	105
18	BXKE-xxx3000-D-1x	38	960	36.48	105
19	BXKE-xxx4000-F-1x	37.4	1440	53.86	105
20	BXKE-xxx5000-G-1x	37.4	1680	62.83	105
21	BXKE-xxx6500-H-1x	36.7	1920	70.46	105
Use 2240 chips					
22	BXKC-xxx0801-A-2x	35	240	8.4	105
23	BXKC-xxx0801-B-2x	17.5	480	8.4	105
24	BXKC-xxx0801-D-2x	8.8	960	8.4	105

25	BXKC-xxx1501-B-2x	35	480	16.8	105
26	BXKC-xxx1501-D-2x	35	960	33.6	105
27	BXKC-xxx2000-C-2x	35.3	720	25.42	105
28	BXKC-xxx3000-D-2x	35.2	960	33.79	105
29	BXKC-xxx4000-E-2x	35.2	1200	42.24	105

The meaning of each part of the sample name are as follow: (i.e. BXKC-xxx0801-A-1x)
BXKC: Product family name;
First and second x: Nominal CCT (27, 30, 35, 40, 50, 56, 65);
Third x: Minimum CRI (E, G);
080: Flux indicator;
1: Color Targeting Designator(0, 1);
A: Array configuration;
1: Gen number;
Last x: CCT bin options(3).

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):

☒	**Testing Laboratory:**	Intertek Testing Services Shanghai Limited	
Testing location/ address.....:		Building No. 86, 1198 Qinzhou Road (North), Shanghai 200233, CHINA	
Tested by (name, function, signature).....:		Strong Zhang (certificate engineer)	Strong Zhang
Approved by (name, function, signature)...:		Eason Zhang (reviewer)	Eason
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address.....:			
Tested by (name, function, signature).....:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address.....:			
Tested by (name + signature).....:			
Witnessed by (name, function, signature) .:			
Approved by (name, function, signature)...:			
☐	**Testing procedure: CTF Stage 3:**		

☐	**Testing procedure: CTF Stage 4:**	
Testing location/ address.....:		
Tested by (name, function, signature).....:		
Witnessed by (name, function, signature) .:		
Approved by (name, function, signature)...:		
Supervised by (name, function, signature) :		

List of Attachments (including a total number of pages in each attachment):

Page 1 to Page 34 : report

Page 35 to Page 40 : Photos

Summary of testing:

Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

A representative sample of the product covered by this report has been tested and complies with the applicable requirements of this standard.

All test performed with positive result.

Tests performed (name of test and test clause):	**Testing location:**
FULL	Intertek Testing Services Shanghai Limited Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, CHINA

Summary of compliance with National Differences:

List of countries addressed

The product fulfils the requirements of EN IEC 62031:2020

Copy of marking plate:

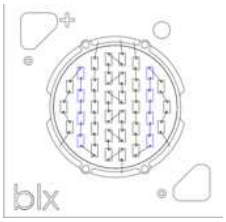
The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Some suffixes from the model nomenclature abcdefg-h-ij (i.e. BXKE-abcdefg-h-ij or BXKC-abcdefg-h-ij) are eliminated so the part no. can't fit on the products.

All model are same except name and paramenter

BXKE Series

BXKC- Series



Remark:

1, The height of graphical symbols shall not be less than 5 mm;

2, The height of letters and numerals shall not be less than 2 mm.

3. According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer' name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.

Test item particulars.....:	Built-in LED module
Classification of installation and use.....:	N/A
Supply Connection.....:	Solder
.....:	
Possible test case verdicts:	
- test case does not apply to the test object.....:	N/A
- test object does meet the requirement.....:	P (Pass)
- test object does not meet the requirement.....:	F (Fail)
Testing.....:	
Date of receipt of test item .....:	Nov 15, 2021
Date (s) of performance of tests.....:	Nov 15, 2021 to Dec 2, 2021

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Clause numbers between brackets refer to clauses in IEC 61347-1

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies).....: Same as applicant

General product information:

BXKC-xxx0801-A-1x,BXKC-xxx0801-B-1x,BXKC-xxx0801-D-1x,BXKC-xxx1501-B-1x,BXKC-xxx1501-D-1x,BXKC-xxx2000-C-1x,BXKC-xxx3000-D-1x,BXKC-xxx4000-E-1x,BXKE-xxx0801-A-2x,BXKE-xxx0801-B-2x,BXKE-xxx0801-D-2x,BXKE-xxx1501-B-2x,BXKE-xxx1501-D-2x,BXKE-xxx0800-A-1x,BXKE-xxx1500-B-1x,BXKE-xxx2000-C-1x,BXKE-xxx30H0-D-1x,BXKE-xxx3000-D-1x,BXKE-xxx4000-F-1x,BXKE-xxx5000-G-1x,BXKE-xxx6500-H-1x are same product except number and arrangement of chips.

BXKC-xxx0801-A-2x,BXKC-xxx0801-B-2x,BXKC-xxx0801-D-2x,BXKC-xxx1501-B-2x,BXKC-xxx1501-D-2x,BXKC-xxx2000-C-2x,BXKC-xxx3000-D-2x,BXKC-xxx4000-E-2x are same product except number and arrangement of chips.

All test are carry out on BXKC-65C4000-E-13 and BXKE-65C6500-H-13.

All models with LEDs to application for the assessment of blue light hazard to light sources and luminaires for IEC TR 62778 and IEC 62471:2008 are classified as Low Risk Group unlimited. More details see Appendix 1

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Clause	Requirement + Test	Result - Remark	Verdict

4	**GENERAL REQUIREMENTS**		
4.2	Classification		
	Built-in module ..... :	Yes ☒ No ☐	—
	Independent module ..... :	Yes ☐ No ☒	—
	Integral module ..... :	Yes ☐ No ☒	—
4.6	Independent modules comply with requirements in IEC 60598-1:2014/AMD1:2017		N/A
4.8	Modules with integrated controlgear providing SELV comply with requirements according to IEC 61347-1:2015/AMD1:2017 clause L.5 to L.11.	(see Annex 1)	N/A

6	**MARKING**		
6.2	**Contents of marking for built-in and for independent LED modules**		
	a) mark of origin		P
	b) model number, type reference		P
	c1) constant voltage module; rated supply voltage and supply frequency		P
	c2) constant current module; rated supply current and supply frequency		P
	d) rated power		P
	e) indication of connections, wiring diagram		P
	f) value of t_c and place on the module		P
	g) Ethr if required		N/A
	h) symbol for built-in modules		P
	i) heat transfer temperature t_d		N/A
	j) power for heat-conduction P_d		N/A
	k) working voltage for insulation		N/A
6.3	**Location of marking for built-in LED modules**		
	- marking of a) and b) in 6.2 on the modules		P
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website		P
6.4	**Location of marking for independent LED modules**		
	- marking of a), b), c) and f) in 6.2 on the modules		N/A
	- marking of other applicable items in 6.2 on the modules or in data sheet, leaflet or website		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
6.5	**Marking of integral LED modules**		
	- information in 6.2 a) to g) in data sheet, leaflet or website		N/A
6.6	**Durable and legibility of marking**		
	- marking on the LED module legible after test with water		P
	- marking not on the LED module legible		P
7	**TERMINALS**		
7.1	**Integral terminals**		
	Screw terminals comply with section 14 of IEC 60598-1	(see Annex 3)	N/A
	Screwless terminals comply with section 15 of IEC 60598-1	(see Annex 4)	N/A
7.2	**Terminals other than integral terminals**		
	Separately approved; component list	(see Annex 2)	N/A
	Ratings suit the conditions		N/A
	Satisfy additional relevant requirements of this standard		N/A
8 (9)	**EARTHING**		
- (9.1)	**Provisions for protective earthing**		
	Terminal complying with clause 8		N/A
	Locked against loosening and not possible to loosen by hand		N/A
	Not possible to loosen clamping means unintentionally on screwless terminals		N/A
	Earthing via means of fixing		N/A
	Earthing terminal only used for the earthing of the control gear		N/A
	All parts of material minimizing the danger of electrolytic corrosion		N/A
	Made of brass or equivalent material		N/A
	Contact surface bare metal		N/A
	Test according 7.2.3 of IEC 60598-1		N/A
- (9.2)	**Provision for functional earthing**		
	Comply with clause 8 and 9.1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Functional earth insulated from live parts by double or reinforced insulation		N/A
- (9.3)	**Lamp controlgear with conductors for protective earthing by tracks on printed circuit board**		
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω .....:		N/A
- (9.4)	**Earthing of built-in lamp controlgear**		
	Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1		N/A
	Earthing terminal only for earthing the built-in controlgear		N/A
- (9.5)	**Earthing via independent controlgear**		
- (9.5.1)	Earth connection to other equipment		
	Looping or through connection, conductor min. 1,5 mm² and of copper or equivalent		N/A
	Protective earthing wires in line with 5.3.1.1 and clause 7		N/A
- (9.5.2)	Earthing of the lamp compartments powered via the independent lamp controlgear		
	Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω .....:		N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		N/A
9 (10)	**PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS**		
- (10.1)	Controlgear protected against accidental contact with live parts	In final whole products	N/A
- (A2)	Voltage measured with 50 kΩ	(see Annex A)	N/A
- (A3)	Voltage > 35 V peak or > 60 V d.c. or protective impendance device	(see Annex A)	N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		N/A
	Adequate mechanical strength on parts providing protection		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
- (10.2)	Capacitors > 0,5 µF: voltage after 1 min (V): < 50 V .....:		N/A
- (10.3)	Controlgear providing SELV		
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N/A
	No connection between output circuit and the body or protective earthing circuit		N/A
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated from earth by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1		N/A
- (10.4)	Accessible conductive parts in SELV circuits		
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N/A
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. ..... :		N/A
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
10 (11)	**MOISTURE RESISTANCE AND INSULATION**		
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (MΩ):		
	For basic insulation ≥ 2 MΩ ..... :		P
	For double or reinforced insulation ≥ 4 MΩ ..... :		N/A
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

11 (12)	**ELECTRIC STRENGTH**		
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage ≤ 50 V, test voltage 500 V		P
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		
	Basic insulation, 2U + 1000 V		N/A
	Supplementary insulation, 2U + 1000 V		N/A
	Double or reinforced insulation, 4U + 2000 V		N/A
	No flashover or breakdown		P
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1		N/A

12 (14)	**FAULT CONDITIONS**		
- (14.1)	When operated under fault conditions the controlgear:		
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	N/A
- (14.2)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (after any reduction in 14.2 - 14.5)	(see appended table)	N/A
- (14.3)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.4)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.5)	Short-circuit across electrolytic capacitors	(see appended table)	N/A
	Short-circuit or interruption of SPDs	(see appended table)	N/A
- (14.6)	After the tests has been carried out on three samples:		
	The insulation resistance ≥ 1 MΩ .....:	>100MΩ	P

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Clause	Requirement + Test	Result - Remark	Verdict
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.7)	Relevant fault condition tests with high-power a.c. supply and in turn to a d.c. supply	N/A	—
12.2	**Overpower condition**		
	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	No fire, smoke or flammable gas is produced		P
	Molten material does not ignite tissue paper, spread below the module		P
14 (15)	**CONSTRUCTION**		
- (15.1)	**Wood, cotton, silk, paper and similar fibrous material**		
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
- (15.2)	**Printed circuits**		
	Printed circuits used as internal connections complies with clause 14		P
15 (16)	**CREEPAGE DISTANCES AND CLEARANCES**		
- (16.1)	**General**		
	Creepage distances and clearances according to 16.2 and 16.3	Control gear was not provided with the LED module. Only LED modules are tested.	P
	Controlgears providing SELV comply with additional requirements in Annex L		N/A
	Insulating lining of metallic enclosures		N/A
	Controlgear protected against pollution comply with Annex P		N/A
- (16.2)	**Creepage distances**		
- (16.2.2)	Minimum creepage distances for working voltages		
	Creepage distances according to Table 7	(see appended table)	P
- (16.2.3)	Creepage distances for working voltages with frequencies above 30 kHz		
	Creepage distances according to Table 8	(see appended table)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
- (16.3)	**Clearances**		
- (16.3.2)	Clearances for working voltages		
	Clearances distances according to Table 9	(see appended table)	P
- (16.3.3)	Clearances for ignition voltages and working voltages with higher frequencies		
	Clearances distances for basic or supplementary insulation according to Table 10		N/A
	Clearances distances for reinforced insulation according to Table 11		N/A
16 (17)	**SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS**		
	Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1)		—
(4.11)	**Electrical connections**		
(4.11.1)	Contact pressure		P
(4.11.2)	Screws:		
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
(4.11.3)	Screw locking:		
	- spring washer		N/A
	- rivets		N/A
(4.11.4)	Material of current-carrying parts		P
(4.11.5)	No contact to wood or mounting surface		P
(4.11.6)	Electro-mechanical contact systems		N/A
(4.12)	**Mechanical connections and glands**		
(4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part .....:		N/A
	Torque test: torque (Nm); part .....:		N/A
	Torque test: torque (Nm); part .....:		N/A
(4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
(4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm) .....:		N/A
	- lampholder; torque (Nm).....:		N/A
	- push-button switches; torque 0,8 Nm .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
(4.12.5)	Screwed glands; force (Nm) ..... :		N/A
17 (18)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		
- (18.1)	Ball-pressure test ..... :	See Test Table 17 (18.1)	P
- (18.2)	Test of printed boards ..... :	See Test Table 17 (18.2)	P
- (18.3)	Glow-wire test (650°C) ..... :	See Test Table 17 (18.3)	P
- (18.4)	Needle-flame test (10 s) ..... :	See Test Table 17 (18.4)	P
- (18.5)	Proof tracking test ..... :	See Test Table 17 (18.5)	N/A
18	**RESISTANCE TO CORROSION**		
	Comply with requirements according 4.18 of IEC 60598-1		N/A
20	**HEAT MANAGEMENT**		
20.1	**General**		
	Fulfil clause 20 if replaceable LED module and when heat conducting thermal interface is needed.		N/A
20.2	**Thermal interface material**		
	Thermal interface material delivered with the module if necessary		N/A
20.3	**Heat protection**		
	Not impair safety when operated under poor heat-conduction conditions according Annex D		N/A
21	**PHOTOBIOLOGICAL SAFETY**		
21.1	**UV radiation**		
	Luminous radiation not exceed 2mW/klm		N/A
21.2	**Blue light hazard**		
	Assessed according to IEC TR 62778		P
21.3	**Infrared radiation**		
	Requirements for infrared radiation when required		N/A
A	**ANNEX A - TESTS**		
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		P

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Clause	Requirement + Test	Result - Remark	Verdict

12 (14)	TABLE: tests of fault conditions	
Part	**Simulated fault**	**Hazard**
LED Model(BXKE-65C6500-H-13)	Cl.12.2 Overpower condition	NO
LED Model(BXKC-65C4000-E-13)	Cl.12.2 Overpower condition	NO
LED Model(BXKE-65C6500-H-13)	Short -circuited	NO
LED Model(BXKC-65C4000-E-13)	Short -circuited	NO
LED Model(BXKE-65C6500-H-13)	Open-circuited	NO
LED Model(BXKC-65C4000-E-13)	Open-circuited	NO

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Clause	Requirement + Test	Result - Remark	Verdict

15 (16)	TABLE: clearance and creepage distance measurements (mm)							
Applicable part of IEC 61347-1 Table 7 – 11*								
Distances	**Insulation type ****	**Measured clearance**	**Required**		**Measured creepage**	**Required**		
			clearance	***Table**		**creepage**	***Table**	
Distance 1:	B	1,6	0,2	Table 7	1,8	1,2	Table 7	
Working voltage (V) ..... :					35			—
Frequency if applicable (kHz) ..... :					/			—
PTI..... :					< 600 ☒ ≥ 600 ☐			—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :					0.0353			—
Pulse voltage if applicable (kV) ..... :					0.5			—
Supplementary information: between live parts of different polarity;								
Distance 2:								
Working voltage (V) ..... :								—
Frequency if applicable (kHz) ..... :								—
PTI..... :					< 600 ☐ ≥ 600 ☐			—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Pulse voltage if applicable (kV) ..... :								—
Supplementary information:								
Distance 3:								
Working voltage (V) ..... :								—
Frequency if applicable (kHz) ..... :								—
PTI..... :					< 600 ☐ ≥ 600 ☐			—
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... :								—
Pulse voltage if applicable (kV) ..... :								—
Supplementary information:								

** Insulation type: B – Basic; S – Supplementary; R – Reinforced

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Clause	Requirement + Test	Result - Remark	Verdict

17 (18.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) ..... :		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Metal Clad PCB	See annex 1	125	1,4mm	
Supplementary information:				

17 (18.2)	TABLE: Test of printed boards				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (s)	Ignition of specified layer Yes/No	Duration of burning (s)	Verdict
Metal Clad PCB	See annex 1	10s	No	0	P
Supplementary information:					

17 (18.3)	TABLE: Glow-wire test				P
Glow wire temperature ..... :		650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Metal Clad PCB	See annex 1	10s	No	0	P
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No) ..... :					
Supplementary information:					

17 (18.4)	TABLE: Needle-flame test				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Metal Clad PCB	See annex 1	10s	No	0	P

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

17 (18.5)	TABLE: Proof tracking test				N/A
Test voltage PTI ..... :		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Supplementary information:					

(A)	ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK		
(A.1)	Comply with A.2 or A.3		N/A
(A.2)			

ANNEX 1	LED MODULES WITH INTEGRAL CONTROLGEAR PROVIDING SELV		
(L.5)	**Protection against electric shock**		
	Comply with 9.2 of IEC 61558-1		N/A
(L.6)	**Heating**		
	No excessive temperatures in normal use		N/A
	Value if capacitor tc marked .....:		—
	Winding insulation classified as Class .....:		—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		N/A
(L.7)	**Short-circuit and overload protection**		
	Comply with tests of clause 15 of IEC 61558-1 with adjustments		N/A
(L.8)	**Insulation resistance and electric strength**		
(L.8.1)	Conditioned 48 h between 91 % and 95 %		N/A
(L.8.2)	Insulation resistance		
	Between input- and output circuits not less than 5 MΩ .....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ .....:		N/A
	Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ .....:		N/A
(L.8.3)	Electric strength		
	1) Between live parts of input circuits and live parts of output circuits .....:		N/A
	2) Over basic or supplementary insulation between:		
	a) live parts having different polarity .....:		N/A
	b) live parts and body if intended to be connected to protective earth .....:		N/A
	c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord .....:		N/A
	d) live parts and an intermediate metal part .....:		N/A
	e) intermediate metal parts and the body .....:		N/A
	f) each input circuit and all other input circuits ..:		N/A
	3) Over reinforced insulation between the body and live parts .....:		N/A
(L.9)	**Construction**		
(L.9.1)	Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6		N/A
	HF transformer comply with 19 of IEC 61558-2-16		N/A
(L.10)	**Components**		
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		N/A
(L.11)	**Creepage distances, clearances and distances through insulation**		
	Creepage distances and clearances not less than in Clause 16		N/A
	Distance through insulation according Table L.5 in IEC 61347-1		
	1) Basic distance through insulation		
	Required distance (mm) .....:		—
	Measured (mm) .....:		N/A
	Supplementary information		—
	2) Supplementary distance through insulation		
	Required distance (mm) .....:		—

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	Measured (mm) .....:		N/A
	Supplementary information		—
	3) Reinforced distance through insulation		
	Required distance (mm) .....:		—
	Measured (mm) .....:		N/A
	Supplementary information		—

ANNEX 2	TABLE: Critical components information					
Object / part No.	**Code**	**Manufacturer/ trademark**	**Type / model**	**Technical data**	**Standard**	**Mark(s) of conformity[1)]**
LED Dies (BXKE/BXKC)	C	Bridgelux	BXCDxxxx	Max. Vf=3.6 Vdc.If=240mA	EN 62031	Test with appliance
LED Dies (BXKC)	D	Bridgelux	BXCDxxxx	Max. Vf=3.6 Vdc.If=350mA	EN 62031	Test with appliance
Description:						
Lens	C	Human	PS-8150A/B	Mixture of Phosphor and Silicone, 150℃	EN 62031	Test with appliance
Description:						
Ring/Dam	C	EarlySun	WB-22-S	Silicone,260	EN 62031	Test with appliance
Description:						
Metal Clad PCB	C	XJN	P129Cnnnnx	Single layer, Nano Aluminum with Thinsulation Substrate(TIS) rated V0,130℃	EN 62031	Test with appliance
Metal Clad PCB	D	HAYWAR PCB	P028P-H-xxxxy	Single layer aluminium metal base,with laminate substrate rated130℃.	EN 62031	Test with appliance
Description:						

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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:

[1)] Provided evidence ensures the agreed level of compliance. See OD-CB2039.

The codes above have the following meaning:

A - The component is replaceable with another one, also certified, with equivalent characteristics

B - The component is replaceable if authorised by the test house

C - Integrated component tested together with the appliance

D - Alternative component

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**Screw terminals (part of the luminaire)**		
(14)	**SCREW TERMINALS**		
(14.2)	Type of terminal..... :		—
	Rated current (A) ..... :		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm²)..... :		—
(14.3.3)	Conductor space (mm)..... :		N/A
(14.4)	Mechanical tests		
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) ..... :	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm) ..... :		N/A
	Torque (Nm)..... :		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N)..... :		N/A
(14.4.8)	Without undue damage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 4	**Screwless terminals (part of the luminaire)**		
(15)	**SCREWLESS TERMINALS**		
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples) .....:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		
	Voltage drop (mV) after 1 h (4 samples).....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:		N/A
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		
	Terminal size and rating		N/A
(15.6.2)	Mechanical tests		

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Clause	Requirement + Test	Result - Remark	Verdict

(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:		N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....:		N/A
(15.6.3)	Electrical tests		
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1		N/A

(15.6.3.1) (15.6.3.2)	**TABLE: Contact resistance test / Heating tests**									
	Voltage drop (mV) after 1 h									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Voltage drop of two inseparable joints									
	Voltage drop after 10th alt. 25th cycle									
	Max. allowed voltage drop (mV) ..... :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Voltage drop after 50th alt. 100th cycle									
	Max. allowed voltage drop (mV) ..... :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Continued ageing: voltage drop after 10th alt. 25th cycle									
	Max. allowed voltage drop (mV) ..... :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
	Continued ageing: voltage drop after 50th alt. 100th cycle									
	Max. allowed voltage drop (mV) ..... :									—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)										
Supplementary information:										

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

	Appendix 1: IEC TR 62778 Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires		
7	**MEASUREMENT INFORMATION FLOW**		
7.1	**Basic flow**		
	'Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case E_{thr} value for RG2 was established the peak value was derived from angular light distribution		N/A
7.2	**Conditions for the radiance measurement**		
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
7.3	**Special cases (I): Replacement by a lamp or LED module of another type**		
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
7.4	**Special cases (II): Arrays and clusters of primary light sources**		
	LED package is evaluated as .....:	☐ RG0 unlimited ☒ RG1 unlimited	P
	E_{thr} of LED package applies to array		N/A
8	**RISK GROUP CLASSIFICATION**		
	Risk group achieved:		
	- .. Risk Group 0 unlimited		N/A
	- .. Risk Group 1 unlimited		P
	- E_{thr} ..... (lx) : Distance to reach RG1 ..... (m) :		N/A N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Spectroradiometric measurement		
	Measurement performed on:	☐ **LED package** ☒ **LED module** ☐ **Lamp** ☐ **Luminaire**	
	Model number.....	BXKC-65C4000-E-13	
	Test voltage (V)	36.1	—
	Test current (mA)	550	—
	Test frequency (Hz).....	N/A	—
	Ambient, t (°C)	25	—
	Measurement distance.....	☒ 20 cm ☐ ... cm	—
	Source size	☒ Non-small ☐ Small : .... mm	—
	Field of view	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)	—

Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	6500	/
x/y colour coordinates			/	/
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	$2{,}64X10^3$	/
Blue light hazard irradiance	E_B	W/m^2	/	/
Luminance	L	cd/m^2	/	/
Illuminance	E	lx	15079,5	/
Supplementary information:				

Table 6.1 Based on EN 62471:2008

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

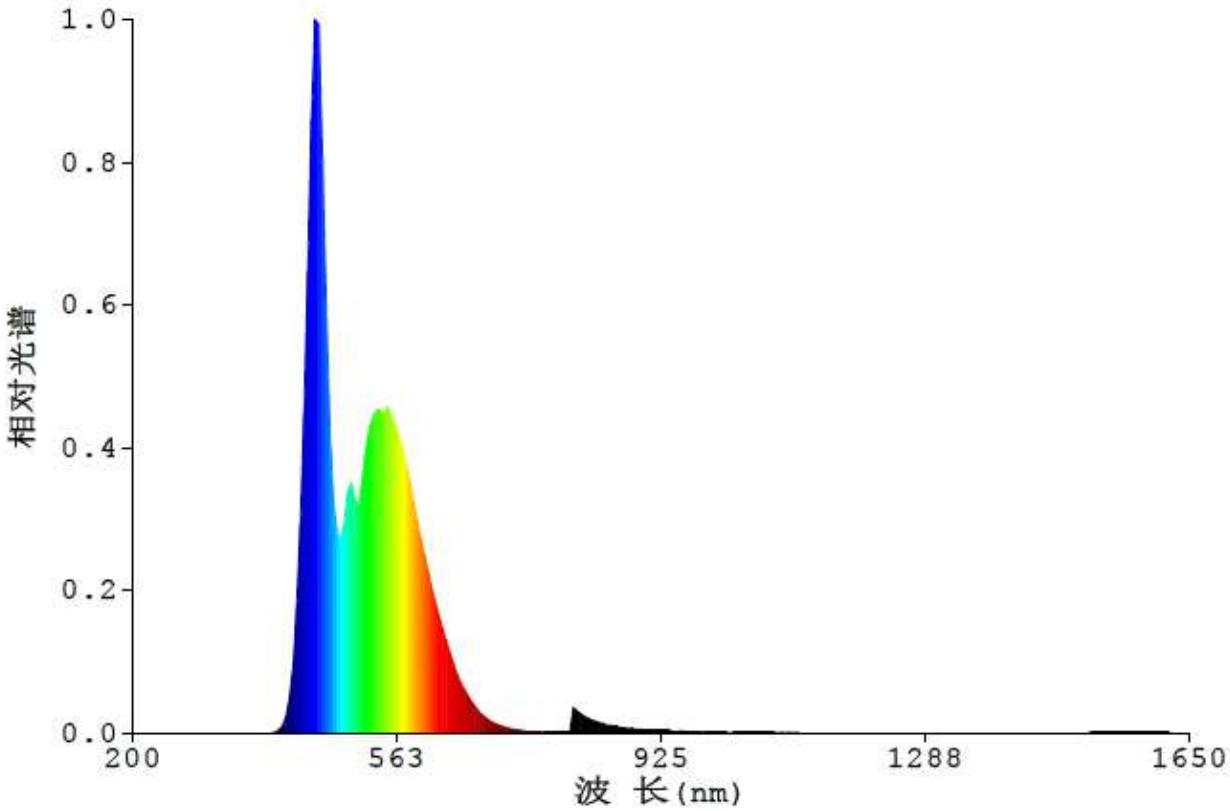
Table 6.1	Emission limits for risk groups of continuous wave lamps									P
Risk	Action spectrum	Symbol	Units	Emission Measurement						
				Exempt		Low risk		Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	$S_{UV}(\lambda)$	E_s	$W \cdot m^{-2}$	0,001	-	-	-	-	-	
Near UV		E_{UVA}	$W \cdot m^{-2}$	0,33	-	-	-	-	-	
Blue light	$B(\lambda)$	L_B	$W \cdot m^{-2} \cdot sr^{-1}$	100	-[1]	10000	$2,64X10^3$	4000000	-	
Blue light, small source	$B(\lambda)$	E_B	$W \cdot m^{-2}$	0,01*	-	1,0	-	400	-	
Retinal thermal	$R(\lambda)$	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	28000/α	-	28000/α	-	71000/α	-	
Retinal thermal, weak visual stimulus**	$R(\lambda)$	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	545000 0,0017≤ α ≤ 0,011	N/A					
				6000/α 0,011≤ α ≤ 0,1	N/A					
IR radiation, eye		E_{IR}	$W \cdot m^{-2}$	100	-	570	-	3200	-	

* Small source defined as one with α < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian.
** Involves evaluation of non-GLS source

NOTE The action functions: see Table 4.1 and Table 4.2
The applicable aperture diameters: see 4.2.1
The limitations for the angular subtenses: see 4.2.2
The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Spectrum waveform	



IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

	Appendix 1: IEC TR 62778 Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires		
7	**MEASUREMENT INFORMATION FLOW**		
7.1	**Basic flow**		
	'Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case E_{thr} value for RG2 was established the peak value was derived from angular light distribution		N/A
7.2	**Conditions for the radiance measurement**		
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
7.3	**Special cases (I): Replacement by a lamp or LED module of another type**		
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
7.4	**Special cases (II): Arrays and clusters of primary light sources**		
	LED package is evaluated as .....:	☐ RG0 unlimited ☒ RG1 unlimited	P
	E_{thr} of LED package applies to array		N/A
8	**RISK GROUP CLASSIFICATION**		
	Risk group achieved:		
	- .. Risk Group 0 unlimited		N/A
	- .. Risk Group 1 unlimited		P
	- E_{thr} ..... (lx) : Distance to reach RG1 ..... (m) :		N/A N/A

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

	TABLE: Spectroradiometric measurement		
	Measurement performed on:	☐ **LED package** ☒ **LED module** ☐ **Lamp** ☐ **Luminaire**	
	Model number.....	BXKE-65C6500-H-13	
	Test voltage (V)	37.2	—
	Test current (mA)	1500	—
	Test frequency (Hz).....	N/A	—
	Ambient, t (°C)	25	—
	Measurement distance.....	☒ 20 cm ☐ ... cm	—
	Source size	☒ Non-small ☐ Small : .... mm	—
	Field of view	☐ 100 mrad ☒ 11 mrad ☐ 1,7 mrad (for small sources)	—

Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	6500	/
x/y colour coordinates			/	/
Blue light hazard radiance	L_B	$W/(m^2 \cdot sr^1)$	$4{,}35X10^3$	/
Blue light hazard irradiance	E_B	W/m^2	/	/
Luminance	L	cd/m^2	/	/
Illuminance	E	lx	23890,2	/
Supplementary information:				

Table 6.1 Based on EN 62471:2008

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

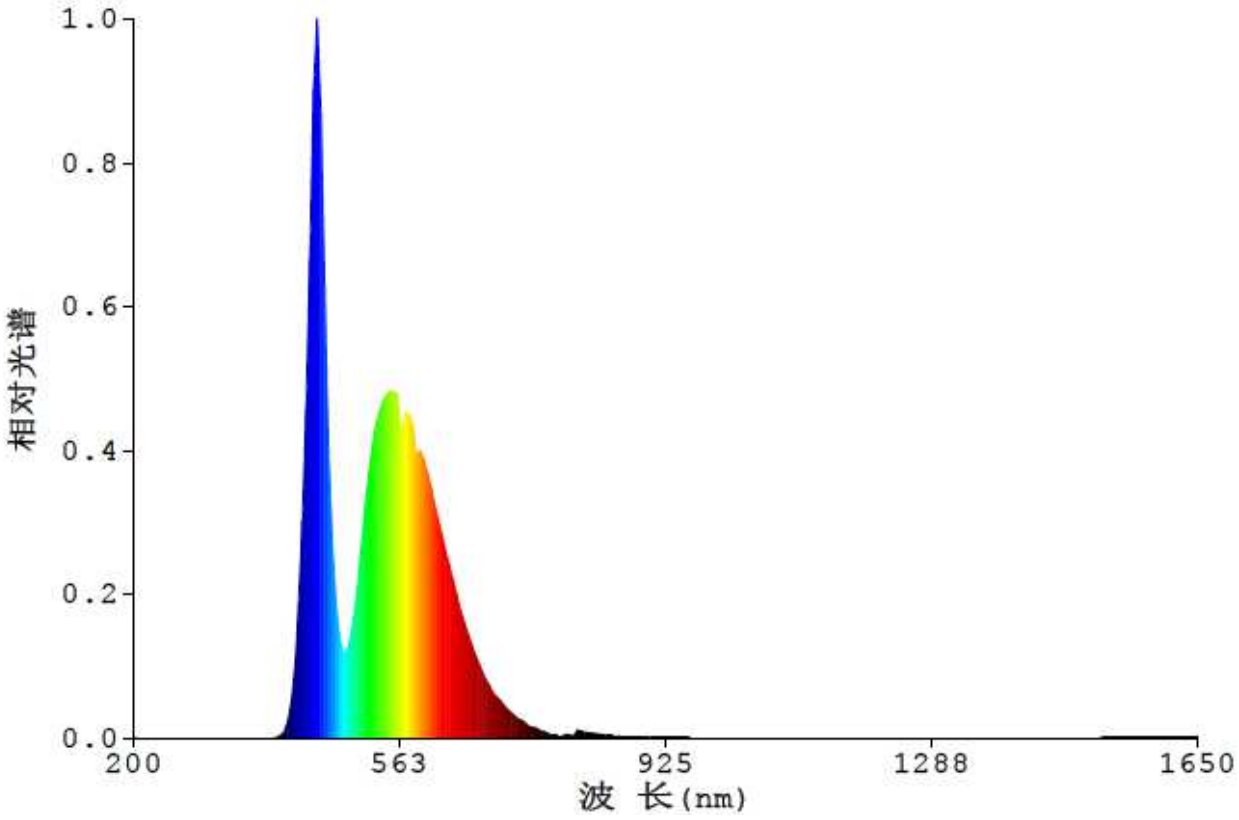
Table 6.1	Emission limits for risk groups of continuous wave lamps									P
Risk	Action spectrum	Symbol	Units	Emission Measurement						
				Exempt		Low risk		Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	$S_{UV}(\lambda)$	E_s	$W \cdot m^{-2}$	0,001	-	-	-	-	-	
Near UV		E_{UVA}	$W \cdot m^{-2}$	0,33	-	-	-	-	-	
Blue light	$B(\lambda)$	L_B	$W \cdot m^{-2} \cdot sr^{-1}$	100	-[1]	10000	$4,35X10^3$	4000000	-	
Blue light, small source	$B(\lambda)$	E_B	$W \cdot m^{-2}$	0,01*	-	1,0	-	400	-	
Retinal thermal	$R(\lambda)$	L_R	$W \cdot m^{-2} \cdot sr^{-1}$	28000/α	-	28000/α	-	71000/α	-	
Retinal thermal, weak visual stimulus**	$R(\lambda)$	L_{IR}	$W \cdot m^{-2} \cdot sr^{-1}$	545000 0,0017≤ α ≤ 0,011	N/A					
				6000/α 0,011≤ α ≤ 0,1	N/A					
IR radiation, eye		E_{IR}	$W \cdot m^{-2}$	100	-	570	-	3200	-	

* Small source defined as one with α < 0,011 radian. Averaging field of view at 10000 s is 0,1 radian.
** Involves evaluation of non-GLS source

NOTE The action functions: see Table 4.1 and Table 4.2
The applicable aperture diameters: see 4.2.1
The limitations for the angular subtenses: see 4.2.2
The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.

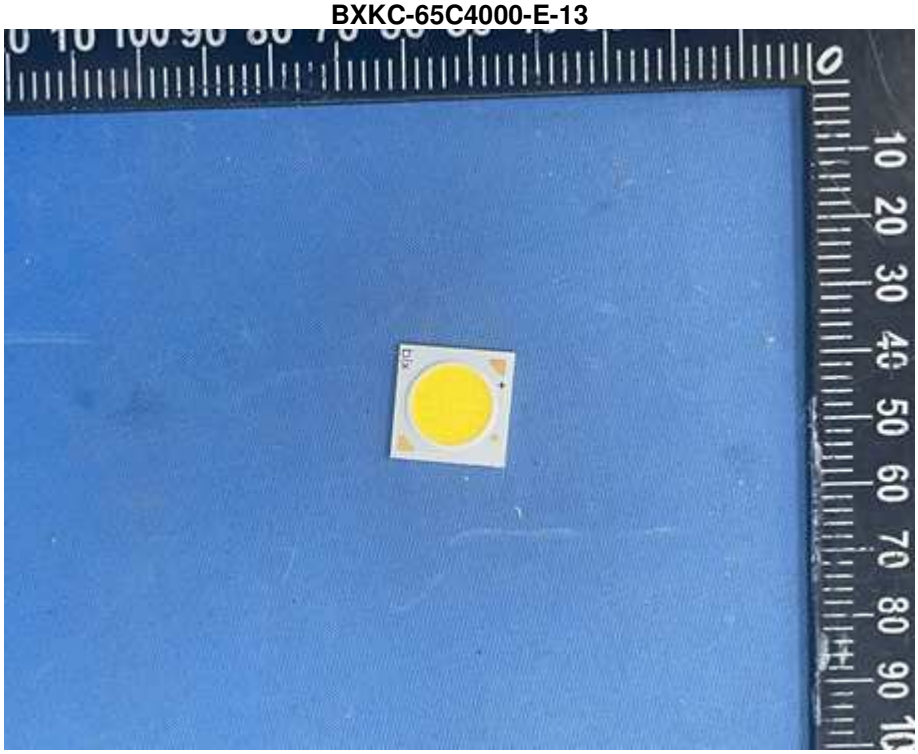
IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

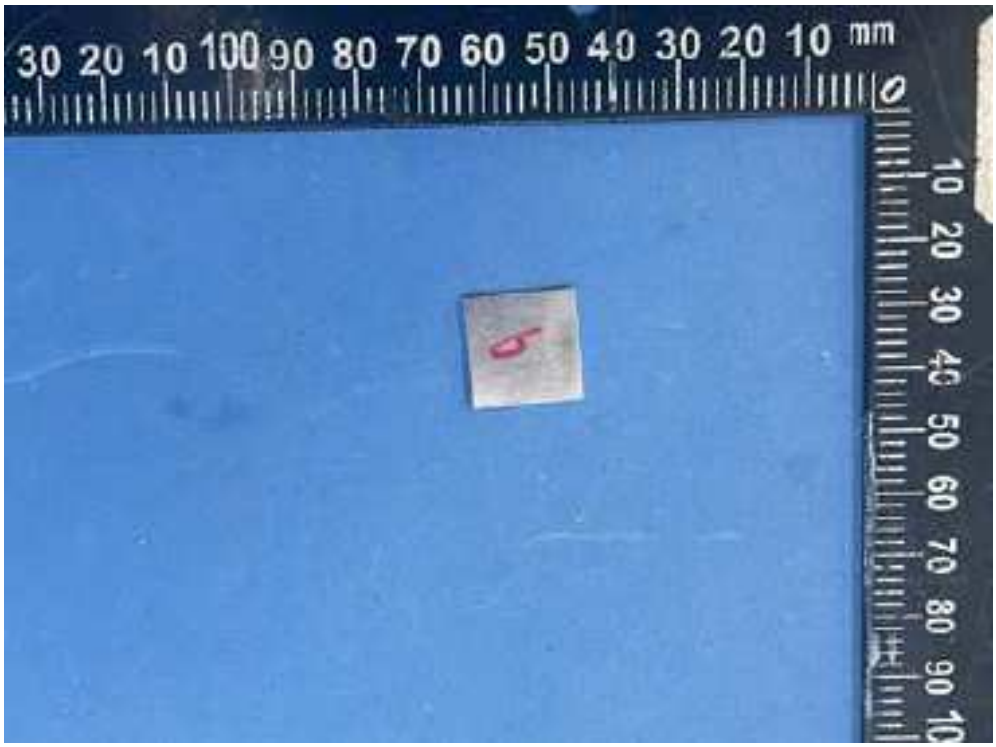
	TABLE: Spectrum waveform	



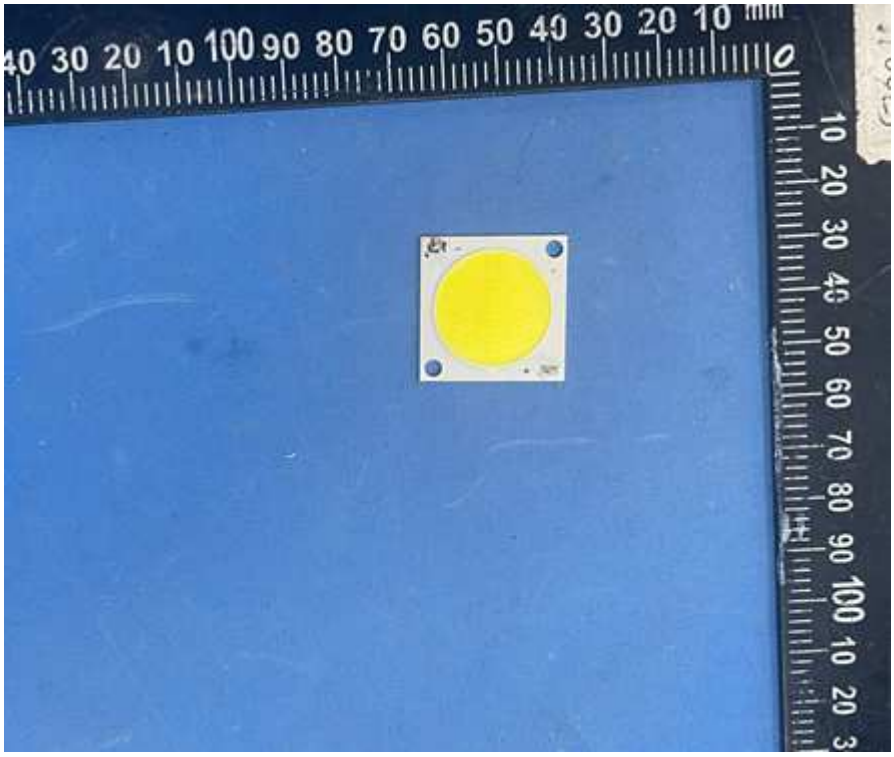
PHOTOS

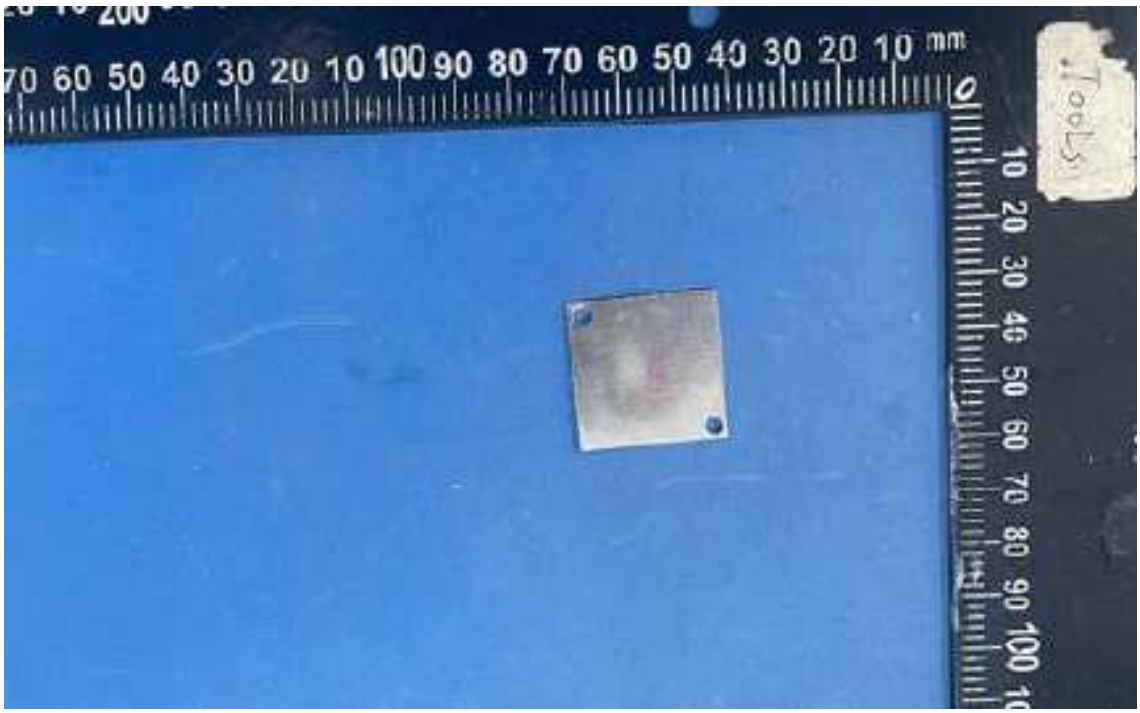
BXKC-65C4000-E-13



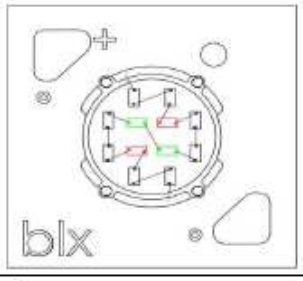
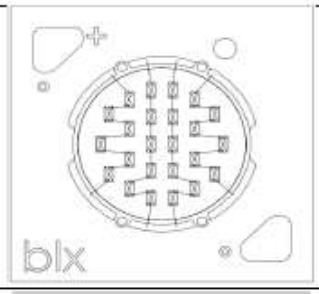
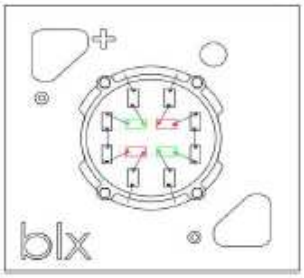
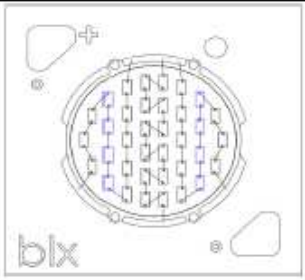
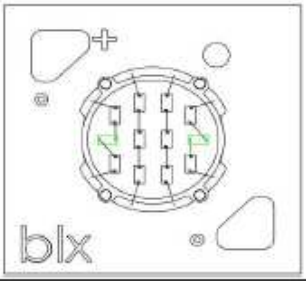
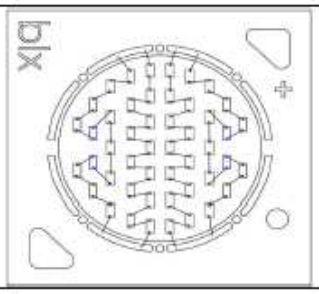


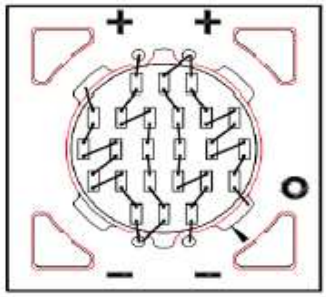
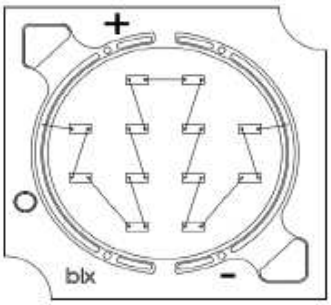
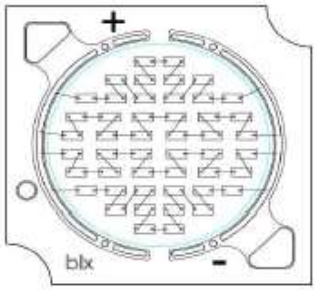
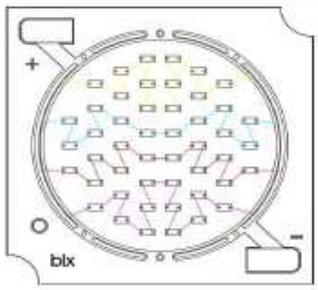
BXKE-65C6500-H-13

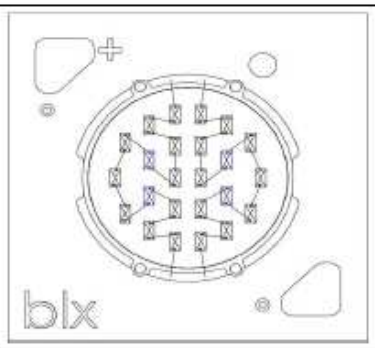
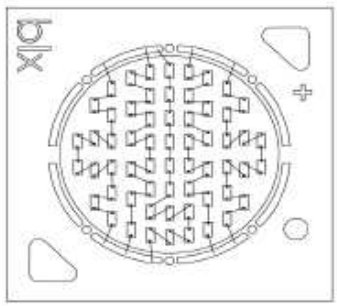
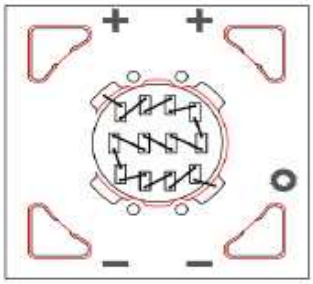
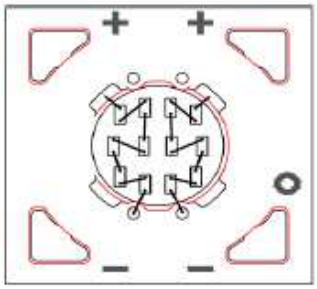


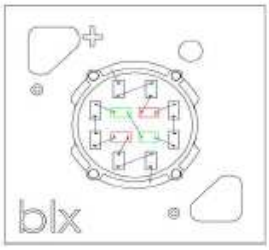
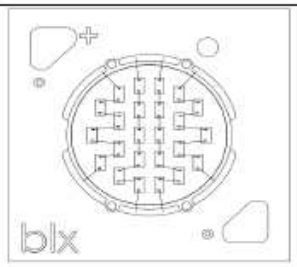
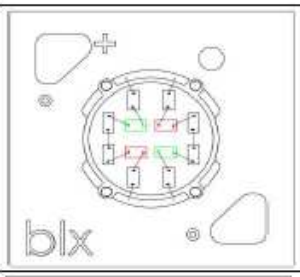
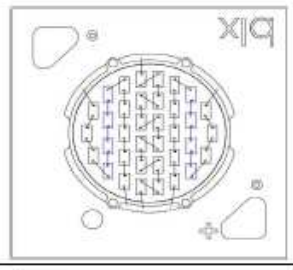
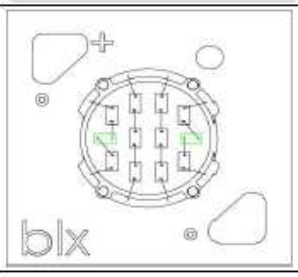
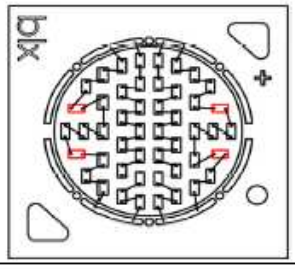


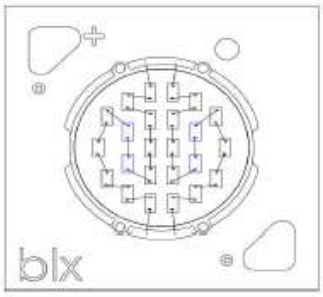
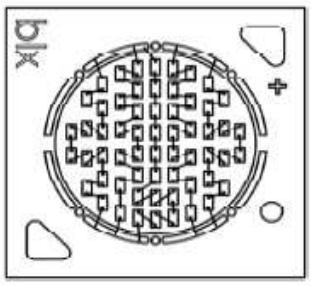
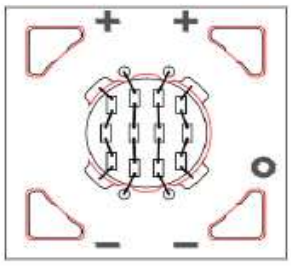
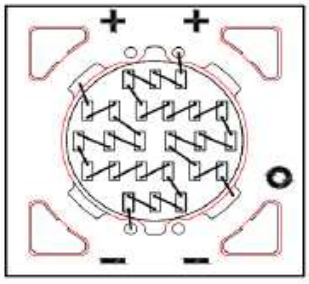
electrical schematic diagram

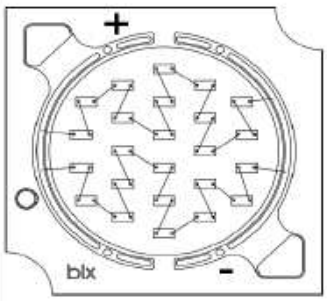
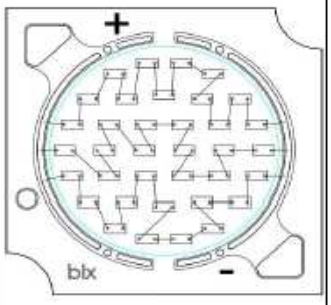
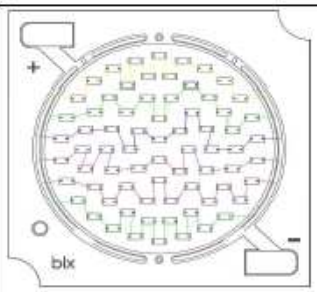
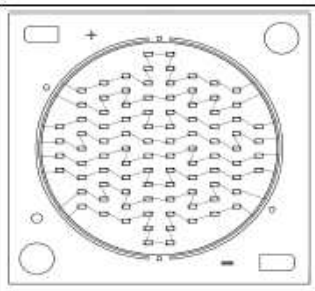
BXKC-xxx0801-A-1x		BXKC-xxx1501-D-1x	
BXKC-xxx0801-B-1x		BXKC-xxx2000-C-1x	
BXKC-xxx0801-D-1x		BXKC-xxx3000-D-1x	

BXKE-xxx1501-D-2x		BXKE-xxx0800-A-1x	
BXKE-xxx30H0-D-1x		BXKE-xxx3000-D-1x	

BXKC-xxx1501-B-1x		BXKC-xxx4000-E-1x	
BXKE-xxx0801-A-2x		BXKE-xxx0801-B-2x	

BXKC-xxx0801-A-2x		BXKC-xxx1501-D-2x	
BXKC-xxx0801-B-2x		BXKC-xxx2000-C-2x	
BXKC-xxx0801-D-2x		BXKC-xxx3000-D-2x	

BXKC-xxx1501-B-2x		BXKC-xxx4000-E-2x	
BXKE-xxx0801-D-2x		BXKE-xxx1501-B-2x	

BXKE-xxx1500-B-1x		BXKE-xxx2000-C-1x	
BXKE-xxx4000-F-1x		BXKE-xxx6500-H-1x	

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